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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/890,282	08/10/2001	Frank Meyer	211586US0PCT	3451

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EXAMINER

SADULA, JENNIFER R

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 08/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/890,282

Applicant(s)

MEYER ET AL.

Examiner

Jennifer R. Sadula

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 April 2003 and 19 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 66-91 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 66-91 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

### DETAILED ACTION

The following Office Action is a complete response to the amendment and arguments filed 30 April 2003 and 19 May 2003.

#### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 66-91 are rejected under 35 U.S.C. 102(b) as being anticipated by Beck et al., U.S. Patent No. 5,798,147 ("Beck").

Beck discloses a process for coating and printing substrates wherein the coating or printing composition comprises a polymerizable liquid crystalline material and a chiral monomer (LC or non-LC), which is applied to a substrate (abstract). Formula I at the top of column 3 of Beck is the exact formula for the liquid crystalline materials sought by applicants. Furthermore the chiral additive of A2 is depicted in formula III of column 10 wherein the chiral compound preferably carries at least one polymerizable group in addition to the two maintained by the liquid crystal component. The variety of applications begin in column 15 and include sheet-like coatings. The viscosity is within the range of the claimed composition and additional polymeric

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binders, adhesion promoters, photoinitiators, UV and weathering stabilizers are all listed beginning in column 15, line 28. All conventional printing processes are anticipated (18:18-28) and the reflection range can be adjusted from infrared to ultra-violet light. Furthermore the novel printing inks may be used to produce marks and security inscriptions invisible to the human eye and therefore useful in anti-counterfeiting markets (18:29-33; 20:55-58). Additional compositions are taught dependent upon the intended use (18:34-20:25). The liquid crystal makes up 20-95% by weight.

Claims 66-68, 70-79 and 81-91 are rejected under 35 U.S.C. 102(e) as being anticipated by Parri et al., U.S. Patent No. 6,217,792 ("Parri").

Parri discloses chiral dopants copolymerized with liquid crystalline materials wherein the chiral dopant materials match the chiral compounds as taught by the Applicants specification page 50 wherein G is the chiral bivalent structure as shown,  $MG^1$  and  $MG^2$  are both 1,4 - phenylene groups,  $X^1$  and  $X^2$  are both either a single bond or oxygen and the R groups are as the R radicals as shown (see Parri columns 7-8 for specific example of such).

The liquid crystalline component of Parri is taught to be a polymerizable liquid crystal  $R^3-L'-G'-E-R^*$ , or more preferably  $P-(Sp-X)_n-A-Z^1-B-(Z^2-C)_p-R^3$  (column 11) wherein the P and the  $R^3$  groups are polymerizable groups such as such as methacryloyloxy, acryloyloxy or vinyloxy. As noted in the examples of columns 11-12, the main liquid crystalline materials of Parri match the Applicants mixtures M2 exactly (see specifically first Parri sample compound).

In accordance with the examples of Parri, the chiral component is added in an amount of between 3.5-11% by weight to the liquid crystal materials. In accordance with the claims the

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material is from 0.001 to 15% by weight. As noted in claim 16 of Parri the material may further comprise at least one catalyst, sensitizer, stabilizer, co-reacting monomer or a surface-active compound. The "co-reacting monomers" encompass photoinitiators, as do the category of "catalysts". The viscosity falls within the range as claimed (see example 1). The compound may be used for coating substrates and for electro-optical elements, color filters, or displays (claim 9-10 and 1:57-67). The compound will selectively reflect light within the range as specified by Applicants claim 81 (see examples). It is inherent to the teaching of Parri that the substrate may indeed be pre-coated in one or more colors, as applicable in accordance with the uses as specified by Parri.

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Claims 66-67, 69-75, 77-85 and 87-91 are rejected under 35 U.S.C. 102(e) as being anticipated by Poetsch et al., U.S. Patent No. 6,291,065 ("Poetsch").

Poetsch teaches pigment flakes having a chiral liquid crystalline polymeric material which serves as either a carrier or coating composition in paints, printing inks, colored plastics, electro-optical devices and security applications (abstract). The chiral polymerizable material is as shown in formula I\* wherein the liquid crystalline material is shown in formula I. The R end units may be further polymerizable as they may be substituted with P-(Sp-X)<sub>n</sub> units. The mesogenic group of the liquid crystalline material is preferably formula II in column 11 and, as shown in column 16, coordinates by exemplification with the claimed embodiments of the present application. The composition as a whole may further include a photoinitiator and optionally non-mesogenic compounds having two or more polymerizable functional groups (column 29). Accompanying filler materials may be added.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 69 and 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parri as applied above, in view of Beck.

Parri discloses chiral dopants copolymerized with liquid crystalline materials wherein the chiral dopant materials match the chiral compounds as taught by the Applicants specification

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page 50 wherein G is the chiral bivalent structure as shown,  $MG^1$  and  $MG^2$  are both 1,4 - phenylene groups,  $X^1$  and  $X^2$  are both either a single bond or oxygen and the R groups are as the R radicals as shown (see Parri columns 7-8 for specific example of such). In accordance with the claims the material is from 0.001 to 15% by weight and the viscosity falls within the range as claimed (see example 1). The compound may be used for coating substrates and for electro-optical elements, color filters, or displays (claim 9-10 and 1:57-67). The compound will selectively reflect light within the range as specified by Applicants claim 26 (see examples). However, Parri does not teach the use of the materials for printing inks or anticounterfeiting.

Beck discloses a process for coating and printing substrates wherein the coating or printing composition comprises a polymerizable liquid crystalline material and a chiral monomer (LC or non-LC), which is applied to a substrate (abstract). The formulation is similar to that of Parri and the variety of applications begin in column 15 and include sheet-like coatings. Furthermore the novel printing inks may be used to produce marks and security inscriptions invisible to the human eye and therefore useful in anti-counterfeiting markets (18:29-33; 20:55-58).

It would have been obvious to one of ordinary skill in the art at the time of invention to use the novel compositions of Parri for the printing and anticounterfeiting purposes of Beck as Beck discloses similar compositions dependent upon the same additives for additional purposes and such additional markets (such as printing and anticounterfeiting) increase the marketability of such a product.

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Claims 68, 76 and 86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Poetsch as applied above.

Poetsch teaches pigment flakes having a chiral liquid crystalline polymeric material which serves as either a carrier or coating composition in paints, printing inks, colored plastics, electro-optical devices and security applications (abstract). The chiral polymerizable material is as shown in formula I\* wherein the liquid crystalline material is shown in formula I. The R end units may be further polymerizable as they may be substituted with P-(Sp-X)<sub>n</sub> units. However, Poetsch does not teach the specified viscosity or pre-coated substrate.

Poetsch does, however, teach substantially similar compositions as those disclosed by the Applicants and it would have been obvious to one of ordinary skill in the art at the time of invention to comprehend such components as both having such a desired reflective range and to be capable of coating on to a pre-coated colored substrate as the reflectivity is desirable to be visible to the naked eye and the substrate is desirable when the materials would be used as a paint or coloring composition as Poetsch discloses.

#### ***Response to Amendment***

Applicant has amended an abstract and the title of the invention to successfully overcome the objections of the previous office action.

#### ***Response to Arguments***

Applicant's arguments filed 30 April 2003 and 19 May 2003 have been fully considered but they are not persuasive. Applicants have attempted to amend the specification by stating

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that, "light, heat and/or oxidation stabilizers that stabilize the liquid-crystalline composition against light, heat and or oxidation", however such is deemed intuitive by the previous "definition" and thus does not overcome the objection to the specification based upon defining the metes and bounds of "stability" of the additives for this invention.

With regard to the art rejections, the Applicants argue that both Parri and Beck fail to disclose the liquid crystalline composition of independent claim 66 comprising at least one compound of formula 1a having two polymerizable groups and at least one compound of formula 1b having only one polymerizable group or that at least one chiral compound in which the variables  $Z^5$ - $Z^{11}$  are polymerizable.

Beck discloses a process for coating and printing substrates wherein the coating or printing composition comprises a polymerizable liquid crystalline material and a chiral monomer (LC or non-LC), which is applied to a substrate (abstract). Examiner reiterates that formula I at the top of column 3 of Beck is the exact formula for the liquid crystalline materials sought by applicants. Furthermore the chiral additive of A2 is depicted in formula III of column 10 wherein the chiral compound preferably carries at least one polymerizable group in addition to the two maintained by the liquid crystal component. Furthermore, additional compositions are taught dependent upon the intended use (18:34-20:25). The liquid crystal makes up 20-95% by weight.

Alternatively, Parri discloses chiral dopants copolymerized with liquid crystalline materials wherein the chiral dopant materials match the chiral compounds as taught by the Applicants specification page 50 wherein G is the chiral bivalent structure as shown,  $MG^1$  and

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$MG^2$  are both 1,4 -phenylene groups,  $X^1$  and  $X^2$  are both either a single bond or oxygen and the R groups are as the R radicals as shown (see Parri columns 7-8 for specific example of such).

The liquid crystalline component of Parri is taught to be a polymerizable liquid crystal  $R'-L'-G'-E-R^*$ , or more preferably  $P-(Sp-X)_n-A-Z^1-B-(Z^2-C)_p-R^3$  (column 11) wherein the P and the  $R^3$  groups are polymerizable groups such as such as methacryloyloxy, acryloyloxy or vinyloxy. As noted in the examples of columns 11-12, the main liquid crystalline materials of Parri match the Applicants mixtures M2 exactly (see specifically first Parri sample compound).

Thus it is unclear what the Applicants are intending to argue as both Parri and Beck do indeed teach the claim limitations of claim 49.

With regard to the rejections based upon Poetsch, the applicants' sole argument is that additives B, C, D and E of claim 66 are not dispersed throughout the liquid crystalline material. Examiner notes that with regard to claim 66, only the additive B is necessary as C, D and E are all optional additions. Thus, with regard to additive B being dispersed throughout the liquid crystalline material of claim 66, Examiner notes again that in Applicants' arguments filed 19 May 2003 (page 17, line 9-10) the phrase "dispersed throughout" is defined by the applicants as encompassing on that which is "homogeneous".

Poetsch teaches pigment flakes having a chiral liquid crystalline polymeric material which serves as either a carrier or coating composition in paints, printing inks, colored plastics, electro-optical devices and security applications (abstract). The composition as a whole may further include a photoinitiator and optionally non-mesogenic compounds having two or more polymerizable functional groups (column 29) and accompanying filler materials may be added.

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Poetsch further discloses that the chiral liquid crystalline polymer material serves as a carrier material for additives such as dyes (abstract). It is understood within the art that such a carrier material fall within the boundaries of having the material "dispersed throughout" or "homogeneous" unless otherwise specified.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

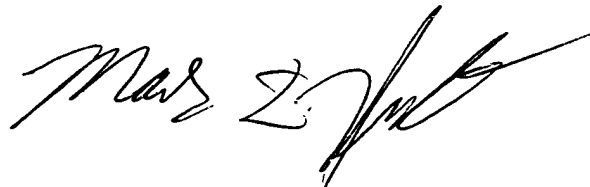
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer R. Sadula whose telephone number is 703.305.4835. The examiner can normally be reached on Monday through Friday, 10am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F. Huff can be reached on 703.308.2464. The fax phone numbers for the

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organization where this application or proceeding is assigned are 703.872.9310 for regular communications and 703.872.9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661.

A handwritten signature in black ink, appearing to read "Mark F. Huff", with a stylized flourish at the end.

MARK F. HUFF  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700

JRS  
August 11, 2003